



April 26, 2013

US EPA RECORDS CENTER REGION 5



468899

Stephen F. Nightingale
Manager, Permit Section
Bureau of Land
Illinois Environmental Protection Agency
1021 North Grand Ave. East
P.O. Box 19276
Springfield, IL 62794-9276

Re: 2018080001 – Winnebago County
Winnebago Landfill – Northern and Southern Expansion Units
Renewal of Permit No. 1991-138-LFM
Addendum to Application Log No. 2012-546

Dear Mr. Nightingale:

On behalf of Winnebago Landfill, submitted herein are an original and three copies of an addendum to the application for renewal of Permit No. 1991-138-LFM responding to draft comments issued by the Illinois Environmental Protection Agency (Illinois EPA) February 8, 2013. The addendum is comprised of two separate documents submitted under separate cover letters. Document 1 is authored by Shaw Environmental, Inc., a CB&I Company, and provides responses to comment numbers 1 through 3. This correspondence represents Document 2 and addresses comments 4 through 7.

Draft comments 4 through 7 are listed below in italic font, followed by the response.

4. *Figure 2 in Volume 2 of the application did not include a grid coordinate system which corresponds to that of approved permit drawings. This information must be included on site plan drawings.*

Figure 2 in Volume 2 of the application has been revised to include a grid coordinate system corresponding to the approved permit drawings. The figure is included as Attachment 1 of this submittal.

5. *The IEPA acknowledges that the results of the "Equipment Blank" sample from 2Q08 in Appendix B show elevated concentrations of 2-butanone and acetone. Therefore, it is appropriate to replace the 2Q08 leachate concentrations of 2-butanone and acetone with the next highest concentrations for use in the model prediction factor calculations in Table 4. However, the applicant has failed to provide any justification for replacing the leachate results for 1-propanol and 4-methyl-2-pentanone from 2Q08. The results of the "Equipment Blank" sample provided in Appendix B do not show any detections of 1-propanol or 4-methyl-2-pentanone. Therefore, it is not appropriate to replace those values in the predicted concentrations calculations.*

The second quarter 2008 leachate results for the parameters 1-propanol and 4-methyl-2-pentanone were elevated due to dilution of the sample matrix. PDC Laboratories, Inc. (PDC) provided a narrative summary for the second quarter 2008 leachate analysis, explaining the application of the large dilution ratio. The narrative indicates the sample was run at a 1:200 dilution due to sample matrix, significantly increasing the concentrations of the subject parameters during that sampling event.

The Illinois EPA was contacted to discuss the ramifications of the sample dilution. Given that the second quarter 2008 concentrations were uncharacteristically elevated, in light of the dilution issue, it was concluded that those concentrations should be excluded from the leachate dataset. It was recommended to use the next highest detected concentrations (within the renewal period). The following table lists the highest detected leachate concentrations and resulting predicted model concentrations. The predicted model concentrations are less than the Applicable Groundwater Quality Standards (AGQSS).

Parameter	Units	Maximum Leachate Concentration	AGQS	Model Prediction Factor	Predicted Model Concentration (PMC)	Pass ? if PMC<AGQS
1-Propanol	ug/l	2700	1000	0.00580	15.66000	YES
4-Methyl-2-pentanone	ug/l	70	10	0.00664	0.46459	YES

Using this approach, the data for the 2Q08 sampling event was excluded and Table 4 of the *Application for Significant Modification For Permit Renewal Groundwater Impact Assessment Review*, dated November 2012 (Log No. 2012-546) has been revised and is included as Attachment 2 of this submittal.

The above referenced narrative summary from PDC is provided as Attachment 3 of this submittal.

6. The potentiometric surface maps from the current review period shows that the groundwater flow direction in the landfill units has remained generally consistent from 1st quarter 2008 through 3rd quarter 2012. However, the 4th quarter 2012 map is drastically different, showing a complete reversal of groundwater flow direction in the landfill units. The map in its current state depicts a radical change in groundwater flow conditions, and by nature may affect the original GIA parameters.

The Fourth Quarter 2012 potentiometric surface map contained erroneous groundwater elevations for wells G17S, G23D, R39S, G40S, G51S, G52S and G52M. This data has been revised with the appropriate groundwater elevation data. The potentiometric surface depicted on the Fourth Quarter 2012 map is consistent with historical groundwater flow directions. The revised potentiometric surface map is provided in Attachment 4 of this submittal.

7. Table 4, titled "Southern Unit Leachate Comparison to GIA Source Concentration," needs to be updated and revised. The table lists several parameters that show leachate detections, but does not list the respective model prediction factors or predicted model concentrations for those parameters. This is not appropriate. The applicant must establish model prediction factors for these parameters (listed below) to determine if the predicted model concentrations will result in exceedances of groundwater quality standards at or

beyond the ZOA (or require a change to the existing GIA). The omitted model prediction factors must be developed using the same criteria and methodology used previously during 2002 GIA determination.

- Biochemical oxygen demand
- Chemical oxygen demand
- Fecal coliform
- pH
- Specific conductance
- Total organic carbon
- Total suspended solids
- 1,1,2-Trichloroethane
- 1,2-Dichloropropane
- Chlorobenzene
- Ethyl acetate
- n-Butanol
- sec-Butylbenzene
- Silvex
- trans-1,3-Dichloro-2-butene

The initial significant modification application was submitted in 1992, at a time when the Illinois EPA was still refining the permit review process; many of the parameters in the current lists were not required at the beginning of the new permitting process. As a result, some of the leachate parameters listed in the permit renewal were not evaluated as part of the initial GIA.

With the exception of the multispecies parameters, a representative surrogate model prediction factor was used to calculate the predicted model concentrations for each detected leachate parameters. The multi-specie parameters and parameters not appropriate for fate transport are:

- biochemical oxygen demand
- chemical oxygen demand
- fecal coliform
- pH
- specific conductance
- total organic carbon
- total suspended solids

Further discussion regarding these parameters is provided below.

Biological Oxygen Demand (BOD)

BOD is the amount of dissolved oxygen needed by aerobic biological organisms to break down organic material at a certain temperature during a specified time period. BOD was not included in any surrogate modeling because of the difficulties in assigning a distinct distribution coefficient, even though many of the individual compounds that contribute to BOD are highly attenuative. BOD is considered a non-Fickian parameter since the concentration gradient is dependent on numerous components. BOD is not an appropriate parameter for contaminant transport modeling. The Illinois EPA has previously stated BOD should not be considered as part of the Groundwater Impact Assessment.

Chemical Oxygen Demand (COD)

COD is a test used to indirectly measure the amount of organic compounds in a liquid sample, typically conducted on surface water samples. Similar to BOD, COD was not included in any surrogate modeling because of the difficulties in assigning a distinct distribution coefficient, even though many of the individual compounds that contribute to COD are highly attenuative. As with BOD, COD is considered a non-Fickian parameter since the concentration gradient is dependent on a reaction with available oxygen and the potential for multiple organic components. COD is not an appropriate parameter for contaminant transport modeling. The Illinois EPA has previously stated COD should not be considered as part of the Groundwater Impact Assessment.

Fecal Coliform Bacteria

Considering the number and type of parameters currently permitted on the G1 and G2 lists, the addition of fecal coliform to the groundwater monitoring program is not justified. Fecal coliform is not likely to be highly mobile in groundwater due to the porosity and permeability of soils, and it is not highly sustainable in groundwater. The characteristics of fecal coliform bacteria significantly limit the benefit of its use for the evaluation of groundwater quality at the facility. Fecal coliform is not an appropriate parameter for contaminant transport modeling. The Illinois EPA has previously stated fecal coliform should not be considered as part of the Groundwater Impact Assessment.

pH

pH is a measured field parameter and is used as an indicator of local groundwater conditions. pH is a reference to hydrogen ion concentration in terms of common positive numbers. The overall pH of water is controlled by the various possible reactions involving the major ions, other non-ionic solutes, solids and gases associated with the solution. Therefore, this parameter cannot adhere to Fick's law for solute transport and cannot be modeled. The Illinois EPA has previously stated pH should not be considered as part of the Groundwater Impact Assessment.

Specific Conductivity

Specific conductivity is a measured field parameter and is used as an indicator of local groundwater conditions, but is not a parameter that is modeled. Specific conductivity refers the ability to conduct an electric current, which depends on the amount of charged ions in solution. Conductivity values do not indicate which specific ions are in solution, and therefore, the parameter does not adhere to Fick's law for solute transport (individual

species). Specific Conductivity is not an appropriate parameter for contaminant transport modeling. The Illinois EPA has previously stated specific conductivity should not be considered as part of the Groundwater Impact Assessment.

Total Organic Carbon (TOC)

TOC is a measureable component of leachate and is naturally occurring within groundwater. It is a measurement of the carbon dioxide released by chemical oxidation of the organic carbon in a sample. As a sum measurement, TOC does not identify specific organic contaminants. It will, however, detect the presence of all carbo-bearing molecules, thus identifying the presence of any organic contaminants, regardless of molecular make-up. The usability of TOC as an indicator parameter is limited as it frequently includes high background levels of natural organic materials in the soil. As such, the establishment of representative background concentrations is important. The parameter does not adhere to Fick's law for solute transport (individual species). TOC is not an appropriate parameter for contaminant transport modeling. The Illinois EPA has previously stated TOC should not be considered as part of the Groundwater Impact Assessment.

Total Suspended Solids (TSS)

TSS are any solids in water that can be trapped by a filter. TSS can include a wide variety of materials, such as silt, clay, decaying plant and animal matter, industrial wastes and sewage. TSS's are present both in the leachate and naturally within the groundwater, limiting its effectiveness as an indicator parameter. The parameter does not adhere to Fick's law for solute transport (individual species). Due to the characteristics of this parameter, contaminant transport modeling of TSS is not warranted. The Illinois EPA has previously stated TSS should not be considered as part of the Groundwater Impact Assessment.

For those parameters that are appropriate, model prediction factors are multiplied by the current maximum leachate concentrations of the surrogate parameters and compared to the current permitted AGQSs. If the product was less than the permitted AGQS, compliance with 35 Ill. Adm. Code 811.317(b) has been demonstrated.

Parameter	Maximum Leachate Concentration	Surrogate	Prediction Factor	Predicted Groundwater Concentration	AQGS
1,1,2-Trichloroethane	8	Ethylbenzene	0.00664	0.0531	5
1,2-Dichloropropane	4	Ethylbenzene	0.00664	0.0266	5
Chlorobenzene	1	Ethylbenzene	0.00664	0.00664	5
Ethyl Acetate	14	Ethylbenzene	0.00664	0.0930	5
n-Butanol	3600	Ethylbenzene	0.00664	23.9	1000
sec-Butylbenzene	1	Ethylbenzene	0.00664	0.00664	5
Silvex	1.3	Ethylbenzene	0.00664	0.00863	2
trans-1,3-Dichloro-2-butene	17	Ethylbenzene	0.00664	0.113	5
Concentrations are in ug/L					

As shown, Ethylbenzene was used as the surrogate for the model prediction factors for each of the listed parameters. The predicted model concentration for each parameter was less than the corresponding AGQS. No predicted exceedences of groundwater quality standards at or beyond the zone of attenuation have occurred. Table 4 (Attachment 2) has been revised to include the subject calculations and comparisons.

Please contact Tom Hilbert at (815) 963-7516 if you have any questions or require additional information.

Sincerely,



Brad J. Huhsberger, LPG
Director of Hydrogeological Services

MTH:bjh:ldb

Enclosure

cc: Tom Hilbert – Rock River Environmental Services
Evan Buskohl – Rock River Environmental Services
Bernie Shore – US EPA Region 5

ATTACHMENT 1
REVISED FIGURE 2

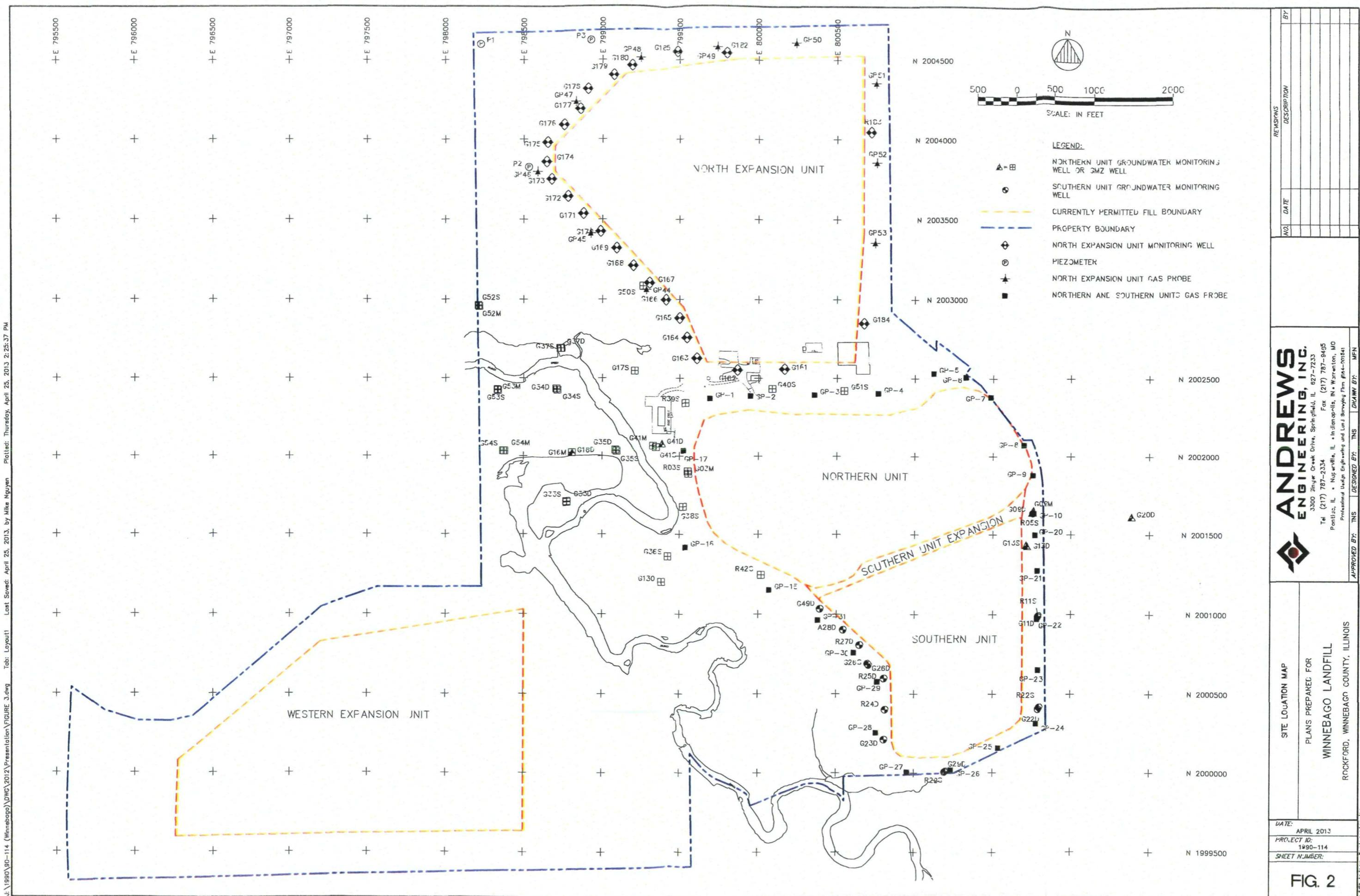


FIG. 2

ATTACHMENT 2
REVISED TABLE 4

Table 4
Southern Unit Leachate Comparison to GIA Source Concentration

**Winnebago Landfill
 Permit Renewal Application**

Parameter	Units	Maximum Leachate Concentration	AGQS	Model Prediction Factor	Predicted Model Concentration (PMC)	Pass ? if PMC<AGQS
Inorganics						
Alkalinity, Bicarbonate as CaCO ₃	mg/l	5600	960	0.00410	22.96000	YES
Aluminum, total	mg/l	0.82	8316.62	0.00016	0.00013	YES
Ammonia as N, total	mg/l	1100	0.65	0.00005	0.05830	YES
Antimony, total	ug/l	0.032	3	0.00567	0.00018	YES
Arsenic, total	ug/l	0.1	3.69	0.00583	0.00058	YES
Barium, total	ug/l	0.78	295.31	0.00144	0.00112	YES
Beryllium, total	ug/l	ND	2.66	0.01120	NA	YES
Biochemical Oxygen Demand	mg/l	1100	7.16	NA	NA	YES
Boron, total	ug/l	7.8	179.1	0.00040	0.00309	YES
Cadmium, total	ug/l	ND	2.63	0.00467	NA	YES
Calcium, total	mg/l	300	231.36	0.00413	1.23900	YES
Chemical Oxygen Demand	mg/l	7400	12.91	NA	NA	YES
Chloride, total	mg/l	1900	190	0.00576	10.94210	YES
Chromium, Hexavalent	mg/l	NA	NA	0.00064	NA	YES
Chromium, total	ug/l	0.17	30.59	0.00100	0.00017	YES
Cobalt, total	ug/l	0.034	4.99	0.00127	0.00004	YES
Copper, total	ug/l	0.099	8.75	0.00087	0.00009	YES
Cyanide, total	mg/l	ND	0.005	0.00847	NA	YES
Fecal Coliform	cfu/100 ml	1300	NA	NA	NA	YES
Fluoride, total	mg/l	0.53	1.46	0.00074	0.00039	YES
Iron, total	ug/l	19	8201	0.00002	0.00034	YES
Lead, total	ug/l	0.012	4.68	0.00005	0.00000	YES
Magnesium, total	mg/l	250	110.28	0.00442	1.10600	YES
Manganese, total	ug/l	0.65	528.32	0.00040	0.00026	YES
Mercury, total	ug/l	0.00032	0.2	0.00064	0.00000	YES
Nickel, total	ug/l	0.25	61.28	0.00193	0.00048	YES
Nitrate as N, total	mg/l	0.9	18.2108	0.00639	0.00575	YES
pH	units	8.95	NA	NA	NA	YES
Phosphorus, total	mg/l	6.2	NA	0.00016	0.00097	YES
Potassium, total	mg/l	540	14.2869	0.01023	5.52636	YES
Selenium, total	ug/l	0.095	4.8	0.00769	0.00073	YES
Silver, total	mg/l	ND	5	0.00167	NA	YES
Sodium, total	mg/l	1600	51.238	0.00058	0.92000	YES
Specific Conductance	umhos/cm ³	13550	3770	NA	NA	YES
Sulfate, total	mg/l	600	288.005	0.02626	15.75420	YES
Thallium, total	ug/l	0.004	3.76	0.00170	0.00001	YES
Tin, total	ug/l	ND	NA	NA	NA	YES
Total Dissolved Solids	mg/l	6400	2800.31	0.00580	37.12000	YES
Total Organic Carbon	mg/l	1600	9.61	NA	NA	YES
Total Suspended Solids	mg/l	240	NA	NA	NA	YES
Vanadium, total	ug/l	0.078	9.496	0.00080	0.00006	YES
Zinc, total	ug/l	0.13	121.64	0.00016	0.00002	YES
Organics						
1,1,1,2-Tetrachloroethane	ug/l	ND	5	NA	NA	YES
1,1,1-Trichloroethane	ug/l	ND	5	0.00664	NA	YES
1,1,2,2-Tetrachloroethane	ug/l	ND	5	NA	NA	YES
1,1,2-Trichloroethane	ug/l	8	5	0.00664	0.05312	YES
1,1-Dichloroethane	ug/l	ND	5	0.00664	NA	YES
1,1-Dichloroethene	ug/l	ND	5	NA	NA	YES
1,1-Dichloropropene	ug/l	ND	5	NA	NA	YES
1,2,3-Trichlorobenzene	ug/l	ND	5	NA	NA	YES
1,2,3-Trichloropropane	ug/l	ND	5	NA	NA	YES
1,2,4-Trichlorobenzene	ug/l	ND	5	NA	NA	YES
1,2,4-Trimethylbenzene	ug/l	57	5	0.00637	0.36309	YES
1,2-Dibromo-3-chloropropane	ug/l	ND	5	0.00664	NA	YES
1,2-Dibromoethane	ug/l	ND	5	NA	NA	YES
1,2-Dichlorobenzene	ug/l	ND	5	0.00004	NA	YES
1,2-Dichloroethane	ug/l	29	5	0.00664	0.19247	YES
1,2-Dichloropropane	ug/l	4	5	0.00640	0.02560	YES
1,3,5-Trimethylbenzene	ug/l	17	5	0.00664	0.11283	YES
1,3-Dichlorobenzene	ug/l	33	5	0.00004	0.00127	YES
1,3-Dichloropropane	ug/l	ND	5	NA	NA	YES
1,3-Dichloropropene	ug/l	ND	5	NA	NA	YES
1,4-Dichlorobenzene	ug/l	31	5	0.00004	0.00119	YES
1-Propanol	ug/l	2700	1000	0.00580	15.66000	YES
2,2-Dichloropropane	ug/l	ND	5	NA	NA	YES
2,4,6-Trichlorophenol	ug/l	ND	NA	NA	NA	YES
2,4-D	ug/l	3.3	10	0.00064	0.00210	YES
2,4-Dichlorophenol	ug/L	ND	NA	NA	NA	YES
2,4-Dimethylphenol	ug/l	ND	NA	NA	NA	YES
2,4-Dinitrophenol	ug/l	ND	NA	NA	NA	YES
2,4-Dinitrotoluene	ug/l	ND	NA	NA	NA	YES
2,6-Dinitrotoluene	ug/l	ND	NA	NA	NA	YES

Table 4
Southern Unit Leachate Comparison to GIA Source Concentration

**Winnebago Landfill
Permit Renewal Application**

Parameter	Units	Maximum Leachate Concentration	AGQS	Model Prediction Factor	Predicted Model Concentration (PMC)	Pass ? if PMC<AGQS
2-Butanone	ug/l	2100	10	0.00083	1.74930	YES
2-Chloroethyl vinyl ether	ug/l	ND	NA	NA	NA	YES
2-Chloronaphthalene	ug/l	ND	NA	NA	NA	YES
2-Chlorophenol	ug/l	ND	NA	NA	NA	YES
2-Chlorotoluene	ug/l	ND	1	0.00004	NA	YES
2-Hexanone	ug/l	360	50	0.00660	2.37600	YES
2-Nitrophenol	ug/l	ND	NA	NA	NA	YES
2-Propanol	ug/l	8000	1000	0.00580	46.40000	YES
3,3'-Dichlorobenzidine	ug/l	ND	NA	NA	NA	YES
4,4'-DDD	ug/l	ND	NA	NA	NA	YES
4,4'-DDE	ug/l	ND	NA	NA	NA	YES
4,4'-DDT	ug/l	ND	0.1	NA	NA	YES
4,6-Dinitro-2-methylphenol	ug/l	ND	NA	NA	NA	YES
4-Bromophenyl-phenylether	ug/l	ND	NA	NA	NA	YES
4-Chlorophenyl-phenyl Ether	ug/l	ND	NA	NA	NA	YES
4-Chlorotoluene	ug/l	ND	1	NA	NA	YES
4-Methyl-2-pentanone	ug/l	70	10	0.00664	0.46459	YES
4-Methylphenol	ug/l	370	10	0.00064	0.23680	YES
4-Nitrophenol	ug/l	ND	NA	NA	NA	YES
Acenaphthene	ug/l	ND	NA	NA	NA	YES
Acetone	ug/l	3100	100	0.00653	20.24610	YES
Alachlor	ug/l	ND	2	0.00664	NA	YES
Aldicarb	ug/l	2.9	1	0.00664	0.01926	YES
Aldrin	ug/l	ND	0.5	NA	NA	YES
alpha-BHC	ug/l	ND	NA	NA	NA	YES
Anthracene	ug/l	ND	NA	NA	NA	YES
Atrazine	ug/l	ND	3	NA	NA	YES
Benzene	ug/l	36	5	0.00664	0.23893	YES
Benzo(a)anthracene	ug/l	ND	NA	NA	NA	YES
Benzo(a)pyrene	ug/l	ND	10	NA	NA	YES
Benzo(b)fluoranthene	ug/l	ND	NA	NA	NA	YES
Benzo(g,h,i)perylene	ug/l	ND	NA	NA	NA	YES
Benzo(k)fluoranthene	ug/l	ND	NA	NA	NA	YES
beta-BHC	ug/l	ND	NA	NA	NA	YES
bis(2-Chloroethoxy)methane	ug/l	ND	NA	NA	NA	YES
bis(2-Chloroethyl) Ether	ug/l	ND	NA	NA	NA	YES
bis(2-Chloroisopropyl)Ether	ug/l	ND	NA	NA	NA	YES
bis(2-Ethylhexyl)phthalate	ug/l	ND	72	NA	NA	YES
bis(Chloromethyl) ether	ug/l	ND	10	NA	NA	YES
Bromobenzene	ug/l	ND	5	NA	NA	YES
Bromochloromethane	ug/l	ND	5	NA	NA	YES
Bromodichloromethane	ug/l	ND	5	NA	NA	YES
Bromoform	ug/l	ND	5	NA	NA	YES
Bromomethane	ug/l	ND	10	0.00664	NA	YES
Butylbenzylphthalate	ug/l	ND	NA	NA	NA	YES
Carbofuran	ug/l	ND	10	NA	NA	YES
Carbon Disulfide	ug/l	21	5	0.00664	0.13938	YES
Carbon Tetrachloride	ug/l	ND	5	NA	NA	YES
Chlordane	ug/l	ND	10	NA	NA	YES
Chlorobenzene	ug/l	1	5	0.00664	0.00664	YES
Chloroethane	ug/l	ND	10	0.00664	NA	YES
Chloroform	ug/l	ND	5	0.00664	NA	YES
Chloromethane	ug/l	ND	10	NA	NA	YES
Chrysene	ug/l	ND	NA	NA	NA	YES
cis-1,2-Dichloroethene	ug/l	27	5	0.00664	0.17928	YES
delta-BHC	ug/l	ND	NA	NA	NA	YES
Dibenzo(a,h)anthracene	ug/l	ND	NA	NA	NA	YES
Dibromochloromethane	ug/l	ND	5	NA	NA	YES
Dibromomethane	ug/l	ND	5	NA	NA	YES
Dichlorodifluoromethane	ug/l	ND	5	0.00664	NA	YES
Dieleadrin	ug/l	ND	0.25	NA	NA	YES
Diethylphthalate	ug/l	ND	100	NA	NA	YES
Dimethylphthalate	ug/l	ND	100	NA	NA	YES
Di-n-butylphthalate	ug/l	ND	100	NA	NA	YES
Di-n-octylphthalate	ug/l	ND	NA	NA	NA	YES
Dioxin Screen	ug/l	ND	NA	NA	NA	YES
Endosulfan I	ug/l	ND	NA	NA	NA	YES
Endosulfan II	ug/l	ND	NA	NA	NA	YES
Endosulfan Sulfate	ug/l	ND	NA	NA	NA	YES
Endrin	ug/l	ND	0.25	NA	NA	YES
Endrin Aldehyde	ug/l	ND	NA	NA	NA	YES
Ethyl Acetate	ug/l	14	NA	0.00664	0.09296	YES
Ethylbenzene	ug/l	100	5	0.00664	0.66370	YES
Fluoranthene	ug/L	ND	NA	NA	NA	YES
Fluorene	ug/l	ND	NA	NA	NA	YES
gamma-BHC (Lindane)	ug/l	ND	10	NA	NA	YES

Table 4
Southern Unit Leachate Comparison to GIA Source Concentration

**Winnebago Landfill
Permit Renewal Application**

Parameter	Units	Maximum Leachate Concentration	AGQS	Model Prediction Factor	Predicted Model Concentration (PMC)	Pass ? if PMC<AGQS
Heptachlor	ug/l	ND	10	NA	NA	YES
Heptachlor Epoxide	ug/l	ND	10	NA	NA	YES
Hexachlorobenzene	ug/l	ND	NA	NA	NA	YES
Hexachlorobutadiene	ug/l	ND	10	NA	NA	YES
Hexachlorocyclopentadiene	ug/l	ND	10	NA	NA	YES
Hexachloroethane	ug/l	ND	NA	NA	NA	YES
Hexane Ext. Material (HEM) by SPE	mg/l	ND	5	0.00003	NA	YES
Indeno(1,2,3-cd)pyrene	ug/l	ND	NA	NA	NA	YES
Iodomethane	ug/l	ND	1	NA	NA	YES
Isopropylbenzene	ug/l	4	5	0.00660	0.02640	YES
m,p-Xylene	ug/l	130	5	0.00005	0.00663	YES
Methoxychlor	ug/l	ND	10	NA	NA	YES
Methylene Chloride	ug/l	20	10	0.00664	0.13274	YES
m-Xylene	ug/l	48	5	0.00004	0.00185	YES
Naphthalene	ug/l	ND	10	0.00604	NA	YES
n-Butanol	ug/l	3600	1000	0.00664	23.90400	YES
n-Butylbenzene	ug/l	2	5	0.00004	0.00008	YES
Nitrobenzene	ug/l	ND	NA	NA	NA	YES
N-Nitrosodimethylamine	ug/l	ND	NA	NA	NA	YES
N-Nitroso-di-n-propylamine	ug/l	ND	NA	NA	NA	YES
N-Nitrosodiphenylamine	ug/l	ND	NA	NA	NA	YES
n-Propylbenzene	ug/l	7	5	0.00004	0.00027	YES
o-Xylene	ug/l	120	5	0.00664	0.79644	YES
Parathion	ug/l	ND	10	0.00064	NA	YES
Pentachlorophenol	ug/l	ND	50	NA	NA	YES
Phenanthrene	ug/l	ND	NA	NA	NA	YES
Phenolics	ug/l	1.3	5	0.00064	0.00083	YES
p-Isopropyltoluene	ug/l	28	5	0.00664	0.18584	YES
Polychlorinated Biphenyls(PCBs)	ug/l	ND	5	0.00660	NA	YES
p-Xylene	ug/l	48	5	0.00004	0.00185	YES
Pyrene	ug/l	ND	NA	NA	NA	YES
sec-Butylbenzene	ug/l	1	5	0.00640	0.00640	YES
Silvex	ug/l	1.3	2	0.00640	0.00832	YES
Styrene	ug/l	ND	5	0.00664	NA	YES
tert-Butylbenzene	ug/l	ND	5	NA	NA	YES
Tetrachloroethene	ug/l	6	5	0.00664	0.03982	YES
Tetrahydrofuran	ug/l	15000	7	0.00019	2.88000	YES
Toluene	ug/l	440	5	0.00182	0.80080	YES
Toxaphene	ug/l	ND	10	NA	NA	YES
trans-1,2-Dichloroethene	ug/l	ND	5	NA	NA	YES
trans-1,3-Dichloropropene	ug/l	ND	5	NA	NA	YES
trans-1,4-Dichloro-2-butene	ug/l	17	5	0.00640	0.10880	YES
Trichloroethene	ug/l	9	10	0.00664	0.05973	YES
Trichlorofluoromethane	ug/l	ND	5	0.00664	NA	YES
Vinyl Acetate	ug/l	ND	10	0.00004	NA	YES
Vinyl Chloride	ug/l	ND	2	0.00004	NA	YES
Xylenes (Total)	ug/l	360	5	0.00134	0.48132	YES

Notes

Notes:

NA - No AGQS Value

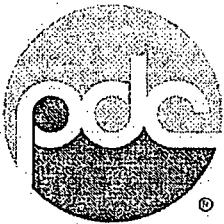
ND - Not Detected

surrogate value (Ethylbenzene = 0.00664)

** The Model Prediction Factors were determined in the 2002 Renewal application by dividing the "computer simulated concentration" by the "initial source concentration" from the original GIA.

ATTACHMENT 3

PDC LABORATORIES LEACAHTE NARRATIVE



PDC Laboratories, Inc.
P.O. Box 9071 • Peoria, IL 61612-9071
(309) 692-9688 • (800) 752-6651 • FAX (309) 692-9689



April 26, 2013

Ms Teresa Sharp
Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield IL 62711

RE: 2Q08 Winnebago South Leachate Volatiles

Dear Teresa:

The volatile organic compounds from second quarter 2008 Winnebago South Leachate have been reviewed. The two leachate samples volatiles were analyzed by EPA Method 624. The samples were initially analyzed on May 22, 2008. On this date the samples were analyzed at 1:1 dilution. The second surrogate did not meet acceptance criteria for L301. Additionally, the third surrogate was outside QC limits for L302. These samples failed with a high bias. The samples were then re-analyzed on May 23, 2008 at 1:200 dilution and the initial surrogate failures were within QC limits. Select compounds were reported from the May 22, 2008 analysis date and additional compounds were reported from the May 23, 2008 date. Some of the compounds reported from May 23, 2008 were 2-Butanone, Acetone, 1-Propanol, 4-Methyl-2-Pentanone and n-Butanol.

Sincerely,

PDC Laboratories Inc.

A handwritten signature in black ink that reads "Gail J Schindler".

Gail Schindler
Project Manager



PDC Laboratories, Inc.

P.O. Box 9071 • Peoria, IL 61612-9071
(309) 692-9688 • (800) 752-6651 • FAX (309) 692-9689



April 26, 2013

VOLATILE ORGANIC COMPOUNDS CASE NARRATIVE – Winnebago Landfill

PDC Laboratories, Inc. received 2 leachate samples on May 14, 2008, on ice and in good condition. This sample set was designated as 08052671.

Sample Ids		Date	
Field	Lab	Collected	Final Analyzed
South Unit L301	08052671-1	05-14-08	05-23-08
South Unit L302	08052671-2	05-14-08	05-23-08

Project Summary

These samples were prepared and analyzed in accordance with the following methodology: EPA Method 624. Due to the nature of the sample matrix, leachate samples are not run neat. These samples were analyzed at 1:1 on May 22, 2008 and then at 1:200 on May 23, 2008.

VOA (624) QC Summary

All holding time criteria were met for all samples.

The instrument performance check using Bromofluorobenzene (BFB) met acceptance criteria

All Initial and Continuing Calibration Standards met PDC acceptance criteria.

All Method Blanks were free of contamination for target analytes above report limit.

Surrogate recoveries were within specified QC criteria with the following exceptions. On May 22, 2008, the samples were analyzed at a 1:1 dilution. The second surrogate was outside QC criteria L301 and the third surrogate was outside QC recovery for L302, both on May 22, 2008. The surrogate recovery failed acceptance criteria with a high bias. The samples were re-analyzed on May 23, 2008 at a 1:200 dilution and surrogate recoveries were within acceptance criteria.

No Matrix Spike and Matrix Spike Duplicate (MS/MSD) was performed on this sample data group.

All associated Laboratory Control Sample (LCS) recoveries were within QC acceptance criteria.

Internal Standard recoveries were within method acceptance criteria for all samples.

PDC LABORATORIES, INC.

GC/MS QC Checklist

Work Group: WG166116
Run ID: R206373Analysis Date: 05/22/08
Batch: MB052208

Analyst: TTS

	<u>N/A</u>	<u>Yes</u>	<u>No</u>	----- "Exceptions" ----- <u>Comments / Corrective Action</u>
Have BFB (VOA) or DFTPP (SV) tuning criteria been met?	_____	X	_____	_____
Has CCV or ICAL passed criteria?	_____	X	_____	CCV
Are the recoveries from the LCS acceptable?	_____	X	_____	_____
Does method blank meet method QC criteria?	_____	X	_____	_____
Are the surrogate recoveries acceptable?	_____	_____	X	Fail Surr Recov
Are the ISTD recoveries acceptable?	_____	_____	X	08052668-4, 2668-5, 2671-1,-2, 2676-2,-4,-5
Are all analyses free of interference's from previous analyses? If not, does the quality of the data remain unimpaired?	_____	X	_____	08052686-4,-5 Fail ISTD
Have all manual integration's been flagged with an M qualifier?	_____	X	_____	_____
Are dilution factors entered correctly?	X	_____	_____	_____
Batch checked for data entry errors?	_____	X	_____	_____

Note: Any "No" answer required a comment.

Additional comments: 08052668-4,-5, 2671-1,-2, 2676-2 Fail Surr 2676-4,-5 fail ISTD /surr Recov
08052671-1,-2, 2674-1 need Dilution MS/MSD fail CompoundsCompleted By: G. A. R.
Date: 5-23-08Reviewed By: R. J. K.
Date: 5/23/08Reviewed By: _____
Date: _____Reviewed By: _____
Date: _____

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052208.B

	CLIENT SAMPLE NO.	SMC1 (DCE) #	SMC2 (TOL) #	SMC3 (BFB) #	OTHER	TOT OUT
01	MB-VOA86-1	99	97	110		0
02	LCS-VOA86-1	102	101	102		0
03	08052447-9	100	94	99		0
04	08052447-10	102	101	107		0
05	08052447-12	107	94	98		0
06	08052447-13	109	93	104		0
07	08052447-18	105	91	99		0
08	08052448-1	103	89	113		0
09	08052448-2	109	94	116		0
10	08052668-4	116	52*	96		1
11	08052668-5	114	64*	104		1
12	08052671-1	107	118*	111		1
13	08052671-2	85	108	142*		1
14	08052674-1	95	97	104		0
15	08052676-1	97	94	102		0
16	08052676-2	93	73*	97		1
17	08052676-3	102	96	115		0
18	08052676-4	107	74*	118		1
19	08052676-5	172*	181*	195*		3
20	08052676-6	103	98	109		0
21	08052676-7	105	87	111		0
22	052676-8	107	81	109		0
23	052676-8MS	105	95	99		0
24	052676-8MSD	103	85	102		0
25						
26						
27						
28						
29						
30						

QC LIMITS

SMC1 (DCE) = 1,2-Dichloroethane-d4	(67-140)
SMC2 (TOL) = Toluene-d8	(78-115)
SMC3 (BFB) = Bromofluorobenzene	(64-134)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052208.B

Matrix Spike - Sample No.: CCV3-VOA86-1

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Chloromethane	20		23	115	5-205
Vinyl Chloride	20		23	115	5-195
Bromomethane	20		17	85	15-185
Chloroethane	20		23	115	40-160
Trichlorofluoromethane	20		22	110	50-150
1,1-Dichloroethene	20		21	105	50-150
Methylene Chloride	20		22	110	60-140
trans-1,2-Dichloroethene	20		21	105	70-130
1,1-Dichloroethane	20		23	115	75-130
Chloroform	20		21	105	70-135
1,1,1-Trichloroethane	20		22	110	75-125
Carbon Tetrachloride	20		22	110	75-125
Benzene	20		22	110	65-135
1,2-Dichloroethane	20		21	105	70-130
Trichloroethene	20		22	110	65-135
1,2-Dichloropropane	20		22	110	35-165
Bromodichloromethane	20		22	110	65-135
2-Chloroethyl Vinyl Eth	20		22	110	5-225
cis-1,3-Dichloropropene	20		22	110	25-175
Toluene	20		22	110	75-125
trans-1,3-Dichloroprope	20		22	110	50-150
1,1,2-Trichloroethane	20		23	115	70-130
Tetrachloroethene	20		22	110	75-125
Dibromochloromethane	20		22	110	70-135
Chlorobenzene	20		21	105	65-135
Ethylbenzene	20		20	100	60-140
Bromoform	20		21	105	70-130
1,1,2,2-Tetrachloroetha	20		23	115	60-140

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052208.B

Matrix Spike - Sample No.: CCV3-VOA86-1

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
1,3-Dichlorobenzene	20		22	110	75-125
1,4-Dichlorobenzene	20		21	105	65-135
1,2-Dichlorobenzene	20		21	105	65-135

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 0 out of 31 outside limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052208.B

Matrix Spike - Sample No.: LCS-VOA86-1

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Chloromethane	20		30	150	20-176
Vinyl Chloride	20		28	140	33-169
Bromomethane	20		21	105	35-139
Chloroethane	20		26	130	63-152
Trichlorofluoromethane	20		25	125	74-131
1,1-Dichloroethene	20		25	125	77-135
Methylene Chloride	20		23	115	85-123
trans-1,2-Dichloroethene	20		23	115	81-131
1,1-Dichloroethane	20		22	110	85-125
2-Butanone	20		10	50	10-115
Chloroform	20		23	115	85-125
1,1,1-Trichloroethane	20		22	110	85-135
Carbon Tetrachloride	20		22	110	81-141
Benzene	20		23	115	85-121
1,2-Dichloroethane	20		22	110	77-143
Trichloroethene	20		23	115	83-127
1,2-Dichloropropane	20		23	115	85-117
Bromodichloromethane	20		22	110	85-120
2-Chloroethyl Vinyl Eth	20		21	105	65-134
cis-1,3-Dichloropropene	20		22	110	85-120
4-Methyl-2-Pentanone	20		27	135	73-147
Toluene	20		23	115	85-122
trans-1,3-Dichloroprope	20		21	105	80-117
1,1,2-Trichloroethane	20		23	115	82-123
Tetrachloroethene	20		23	115	82-123
Dibromochloromethane	20		22	110	77-123
Chlorobenzene	20		22	110	83-125
Ethylbenzene	20		22	110	81-126

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052208.B

Matrix Spike - Sample No.: LCS-VOA86-1

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Bromoform	20		20	100	56-140
1,1,2,2-Tetrachloroethane	20		25	125	58-142
1,3-Dichlorobenzene	20		22	110	70-123
1,4-Dichlorobenzene	20		23	115	70-127
1,2-Dichlorobenzene	20		22	110	67-124

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 0 out of 33 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MB-VOA86-1

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052208.B

Lab File ID: MB052203 Lab Sample ID: MB-VOA86-1

Date Analyzed: 05/22/08 Time Analyzed: 0946

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: MB

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01 LCS-VOA86-1	LCS-VOA86-1	MB052204	1016
02 08052447-9	08052447-9	MB052206	1127
03 08052447-10	08052447-10	MB052207	1157
04 08052447-12	08052447-12	MB052208	1227
05 08052447-13	08052447-13	MB052209	1257
06 08052447-18	08052447-18	MB052210	1327
07 08052448-1	08052448-1	MB052211	1357
08 08052448-2	08052448-2	MB052212	1428
09 08052668-4	08052668-4	MB052213	1458
10 08052668-5	08052668-5	MB052214	1528
11 08052671-1	08052671-1	MB052215	1558
12 08052671-2	08052671-2	MB052216	1628
13 08052674-1	08052674-1	MB052217	1658
14 08052676-1	08052676-1	MB052218	1728
15 08052676-2	08052676-2	MB052219	1758
16 08052676-3	08052676-3	MB052220	1828
17 08052676-4	08052676-4	MB052221	1859
18 08052676-5	08052676-5	MB052222	1930
19 08052676-6	08052676-6	MB052223	2000
20 08052676-7	08052676-7	MB052224	2031
21 052676-8	08052676-8	MB052225	2102
22 052676-8MS	08052676-8MS	MB052226	2132
23 052676-8MSD	08052676-8MSD	MB052227	2203
24			
25			
26			
27			
28			
29			
30			

COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052208.B

Lab File ID: MB052201 BFB Injection Date: 05/22/08

Instrument ID: MB BFB Injection Time: 0829

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	26.6
75	30.0 - 60.0% of mass 95	53.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	5.9
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	59.1
175	5.0 - 9.0% of mass 174	3.4 (5.7)1
176	95.0 - 101.0% of mass 174	59.3 (100.4)1
177	5.0 - 9.0% of mass 176	4.6 (7.7)2

1-Value is % mass 174

2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01 CCV3-VOA86-1	CCV3-VOA86-1	MB052202	05/22/08	0859
02 MB-VOA86-1	MB-VOA86-1	MB052203	05/22/08	0946
03 LCS-VOA86-1	LCS-VOA86-1	MB052204	05/22/08	1016
04 08052447-9	08052447-9	MB052206	05/22/08	1127
05 08052447-10	08052447-10	MB052207	05/22/08	1157
06 08052447-12	08052447-12	MB052208	05/22/08	1227
07 08052447-13	08052447-13	MB052209	05/22/08	1257
08 08052447-18	08052447-18	MB052210	05/22/08	1327
09 08052448-1	08052448-1	MB052211	05/22/08	1357
10 08052448-2	08052448-2	MB052212	05/22/08	1428
11 08052668-4	08052668-4	MB052213	05/22/08	1458
12 08052668-5	08052668-5	MB052214	05/22/08	1528
13 08052671-1	08052671-1	MB052215	05/22/08	1558
14 08052671-2	08052671-2	MB052216	05/22/08	1628
15 08052674-1	08052674-1	MB052217	05/22/08	1658
16 08052676-1	08052676-1	MB052218	05/22/08	1728
17 08052676-2	08052676-2	MB052219	05/22/08	1758
18 08052676-3	08052676-3	MB052220	05/22/08	1828
19 08052676-4	08052676-4	MB052221	05/22/08	1859
20 08052676-5	08052676-5	MB052222	05/22/08	1930
21 08052676-6	08052676-6	MB052223	05/22/08	2000
22 08052676-7	08052676-7	MB052224	05/22/08	2031

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052208.B

Lab File ID: MB052201 BFB Injection Date: 05/22/08

Instrument ID: MB BFB Injection Time: 0829

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	26.6
75	30.0 - 60.0% of mass 95	53.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	5.9
173	Less than 2.0% of mass 174	0.0 (- 0.0)1
174	Greater than 50.0% of mass 95	59.1
175	5.0 - 9.0% of mass 174	3.4 (- 5.7)1
176	95.0 - 101.0% of mass 174	59.3 (100.4)1
177	5.0 - 9.0% of mass 176	4.6 (- 7.7)2

1-Value is % mass 174

2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01 052676-8	08052676-8	MB052225	05/22/08	2102
02 052676-8MS	08052676-8MS	MB052226	05/22/08	2132
03 052676-8MSD	08052676-8MSD	MB052227	05/22/08	2203
04				
05				
06				
07				
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18				
19				
20				
21				
22				

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052208.B

Instrument ID: MB Calibration Date: 05/22/08 Time: 0859

Lab File ID: MB052202 Init. Calib. Date(s): 05/21/08 05/21/08

Heated Purge: (Y/N) N Init. Calib. Times: 1750 2022

GC Column: RTX-624 ID: 0.18 (mm)

COMPOUND	RRF	RRF20	MIN RRF	%D	MAX %D
Dichlorodifluoromethane	0.261	0.324	0.01	24.1	35.0
Chloromethane	0.441	0.513	0.01	16.3	35.0
Vinyl Chloride	0.447	0.514	0.01	15.0	35.0
Bromomethane	0.369	0.312	0.01	15.4	35.0
Chloroethane	0.348	0.400	0.01	14.9	35.0
Trichlorofluoromethane	0.463	0.520	0.01	12.3	35.0
Dichlorofluoromethane	0.898	0.981	0.01	9.2	35.0
Ethyl Ether	0.347	0.381	0.01	9.8	35.0
Acrolein	0.082	0.088	0.01	7.3	35.0
Freon	0.305	0.353	0.01	15.7	35.0
1,1-Dichloroethene	0.320	0.337	0.01	5.3	35.0
Acetone	0.144	0.167	0.01	16.0	35.0
Iodomethane	0.331	0.396	0.01	19.6	35.0
Carbon Disulfide	1.057	1.185	0.01	12.1	35.0
Isopropanol	0.023	0.024	0.01	4.3	35.0
3-Chloroprene	0.186	0.214	0.01	15.0	35.0
Acetonitrile	0.061	0.054	0.01	11.5	35.0
Methylene Chloride	0.413	0.462	0.01	11.9	35.0
MTBE	0.803	0.870	0.01	8.3	35.0
trans-1,2-Dichloroethene	0.362	0.382	0.01	5.5	35.0
Acrylonitrile	0.143	0.154	0.01	7.7	35.0
Hexane	0.614	0.703	0.01	14.5	35.0
1,1-Dichloroethane	0.756	0.860	0.01	13.8	35.0
Chloroprene	0.549	0.674	0.01	22.8	35.0
Vinyl Acetate	0.653	0.933	0.01	42.9	35.0
1-Propanol	0.001	0.002	0.01	100.0	35.0
2,2-Dichloropropane	0.425	0.490	0.01	15.3	35.0
cis-1,2-Dichloroethene	0.315	0.339	0.01	7.6	35.0
2-Butanone	0.420	0.542	0.01	29.0	35.0
Ethyl Acetate	0.120	0.144	0.01	20.0	35.0
Propionitrile	0.042	0.046	0.01	9.5	35.0
Bromochloromethane	0.122	0.141	0.01	15.6	35.0
Tetrahydrofuran	0.026	0.028	0.01	7.7	35.0
Methacrylonitrile	0.210	0.210	0.01	0.0	35.0
sec-Butanol	0.020	0.020	0.01	0.0	35.0
Chloroform	0.594	0.635	0.01	6.9	35.0
Cyclohexane	0.606	0.657	0.01	8.4	35.0

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052208.B

Instrument ID: MB Calibration Date: 05/22/08 Time: 0859

Lab File ID: MB052202 Init. Calib. Date(s): 05/21/08 05/21/08

Heated Purge: (Y/N) N Init. Calib. Times: 1750 2022

GC Column: RTX-624 ID: 0.18 (mm)

COMPOUND	RRF	RRF20	MIN RRF	%D	MAX %D
1,1,1-Trichloroethane	0.387	0.432	0.01	11.6	35.0
Carbon Tetrachloride	0.274	0.298	0.01	8.8	35.0
1,1-Dichloropropene	0.477	0.526	0.01	10.3	35.0
Benzene	1.278	1.386	0.01	8.4	35.0
1,2-Dichloroethane	0.796	0.838	0.01	5.3	35.0
Isobutanol	0.011	0.012	0.01	9.1	35.0
Propyl Ether	0.257	0.277	0.01	7.8	35.0
Trichloroethene	0.279	0.310	0.01	11.1	35.0
n-Butanol	0.005	0.004	0.01	20.0	35.0
1,2-Dichloropropane	0.358	0.405	0.01	13.1	35.0
Dibromomethane	0.101	0.124	0.01	22.8	35.0
1,4-Dioxane	0.002	0.002	0.01	0.0	35.0
Methyl Methacrylate	0.323	0.333	0.01	3.1	35.0
Bromodichloromethane	0.399	0.450	0.01	12.8	35.0
2-Nitropropane	0.066	0.072	0.01	9.1	35.0
2-Chloroethyl Vinyl Ether	0.177	0.199	0.01	12.4	35.0
cis-1,3-Dichloropropene	0.497	0.548	0.01	10.3	35.0
4-Methyl-2-Pentanone	0.280	0.330	0.01	17.8	35.0
Toluene	0.682	0.766	0.01	12.3	35.0
trans-1,3-Dichloropropene	0.410	0.454	0.01	10.7	35.0
Ethyl Methacrylate	1.494	1.640	0.01	9.8	35.0
1,1,2-Trichloroethane	0.205	0.232	0.01	13.2	35.0
Tetrachloroethene	0.232	0.260	0.01	12.1	35.0
1,3-Dichloropropane	0.785	0.819	0.01	4.3	35.0
2-Hexanone	0.768	1.065	0.01	38.7	35.0
Dibromochloromethane	0.326	0.355	0.01	8.9	35.0
1,2-Dibromoethane	0.337	0.362	0.01	7.4	35.0
Chlorobenzene	1.133	1.171	0.01	3.4	35.0
Ethylbenzene	0.602	0.617	0.01	2.5	35.0
1,1,1,2-Tetrachloroethane	0.336	0.345	0.01	2.7	35.0
Meta-Para Xylenes	0.764	0.781	0.01	2.2	35.0
0-Xylene	0.695	0.723	0.01	4.0	35.0
Styrene	1.267	1.271	0.01	0.3	35.0
Bromoform	0.140	0.149	0.01	6.4	35.0
Isopropylbenzene	3.790	4.150	0.01	9.5	35.0
Cyclohexanone	0.015	0.019	0.01	26.7	35.0
Bromobenzene	2.184	2.359	0.01	8.0	35.0

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052208.B

Instrument ID: MB Calibration Date: 05/22/08 Time: 0859

Lab File ID: MB052202 Init. Calib. Date(s): 05/21/08 05/21/08

Heated Purge: (Y/N) N Init. Calib. Times: 1750 2022

GC Column: RTX-624 ID: 0.18 (mm)

COMPOUND	RRF	RRF20	MIN RRF	%D	MAX %D
1,1,2,2-Tetrachloroethane	1.237	1.410	0.01	14.0	35.0
n-Propylbenzene	1.095	1.190	0.01	8.7	35.0
1,2,3-Trichloropropane	1.071	1.140	0.01	6.4	35.0
trans-1,4-Dichloro-2-Butene	0.319	0.357	0.01	11.9	35.0
2-Chlorotoluene	0.952	1.050	0.01	10.3	35.0
1,3,5-Trimethylbenzene	3.602	3.895	0.01	8.1	35.0
4-Chlorotoluene	1.016	1.098	0.01	8.1	35.0
tert-Butylbenzene	2.769	3.065	0.01	10.7	35.0
Pentachloroethane	0.110	0.124	0.01	12.7	35.0
1,2,4-Trimethylbenzene	3.600	3.896	0.01	8.2	35.0
sec-Butylbenzene	4.772	5.281	0.01	10.7	35.0
1,3-Dichlorobenzene	1.669	1.820	0.01	9.0	35.0
p-Isopropyltoluene	3.664	4.035	0.01	10.1	35.0
1,4-Dichlorobenzene	1.785	1.915	0.01	7.3	35.0
n-Butylbenzene	4.340	4.828	0.01	11.2	35.0
1,2-Dichlorobenzene	1.584	1.697	0.01	7.1	35.0
1,2,4-Trichlorobenzene	0.724	0.869	0.01	20.0	35.0
Hexachlorobutadiene	0.261	0.341	0.01	30.6	35.0
Naphthalene	2.261	2.433	0.01	7.6	35.0
1,2,3-Trichlorobenzene	0.661	0.788	0.01	19.2	35.0
1,2-Dibromo-3-chloropropane	0.170	0.193	0.01	13.5	35.0
1,2-Dichloroethane-d4	0.370	0.372	0.01	0.5	35.0
Toluene-d8	0.860	0.896	0.01	4.2	35.0
Bromofluorobenzene	1.324	1.329	0.01	0.4	35.0

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052208.B

Lab File ID (Standard): MB052202 Date Analyzed: 05/22/08

Instrument ID: MB Time Analyzed: 0859

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

	IS1 AREA #	RT #	IS2 (CBZ) AREA #	RT #	IS3 (DCB) AREA #	RT #
12 HOUR STD	91995	7.62	56755	12.63	22240	16.73
UPPER LIMIT	183990	8.12	113510	13.13	44480	17.23
LOWER LIMIT	45998	7.12	28378	12.13	11120	16.23
CLIENT SAMPLE NO.						
01 MB-VOA86-1	97556	7.61	55175	12.63	18785	16.73
02 LCS-VOA86-1	90101	7.61	54013	12.61	19085	16.72
03 08052447-9	82209	7.61	49993	12.62	16935	16.73
04 08052447-10	78607	7.60	48618	12.62	15522	16.72
05 08052447-12	79506	7.60	47986	12.62	15761	16.72
06 08052447-13	75861	7.61	45689	12.61	14872	16.71
07 08052447-18	75158	7.60	46871	12.62	15542	16.72
08 08052448-1	75099	7.60	45624	12.61	13968	16.71
09 08052448-2	71878	7.60	42039	12.61	13795	16.72
10 08052668-4	69722	7.60	43558	12.61	15012	16.71
11 08052668-5	70358	7.60	44257	12.62	14609	16.72
12 08052671-1	77902	7.60	50243	12.61	18304	16.72
13 08052671-2	122108	7.60	72994	12.62	27227	16.72
14 08052674-1	92335	7.60	54331	12.61	20267	16.72
15 08052676-1	87053	7.60	51533	12.62	18807	16.72
16 08052676-2	75459	7.61	48015	12.62	16858	16.73
17 08052676-3	67980	7.60	40977	12.62	11980	16.72
18 08052676-4	63176	7.60	38248	12.62	10945*	16.72
19 08052676-5	37100*	7.61	22510*	12.62	7200*	16.73
20 08052676-6	81991	7.61	49903	12.61	17593	16.72
21 08052676-7	82245	7.61	48627	12.62	16576	16.72
22 052676-8	81015	7.61	44695	12.61	15065	16.73

IS1 = Fluorobenzene

IS2 (CBZ) = Chlorobenzene-d5

IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.

* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052208.B

Lab File ID (Standard): MB052202 Date Analyzed: 05/22/08

Instrument ID: MB Time Analyzed: 0859

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

	IS1 AREA #	RT #	IS2 (CBZ) AREA #	RT #	IS3 (DCB) AREA #	RT #
12 HOUR STD	91995	7.62	56755	12.63	22240	16.73
UPPER LIMIT	183990	8.12	113510	13.13	44480	17.23
LOWER LIMIT	45998	7.12	28378	12.13	11120	16.23
CLIENT SAMPLE NO.						
01 052676-8MS	81009	7.61	49733	12.61	18127	16.71
02 052676-8MSD	78435	7.60	49079	12.62	15212	16.72
03						
04						
05						
06						
07						
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09						
10						
11						
12						
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14						
15						
16						
17						
18						
19						
20						
21						
22						

IS1 = Fluorobenzene

IS2 (CBZ) = Chlorobenzene-d5

IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.

* Values outside of QC limits.

PDC LABORATORIES, INC.

GC/MS QC Checklist

Work Group: WG166260
Run ID: R206464

Analysis Date: 05/23/08
Batch: MB052308
Analyst: TTS

	<u>N/A</u>	<u>Yes</u>	<u>No</u>	----- "Exceptions" ----- Comments / Corrective Action
Have BFB (VOA) or DFTPP (SV) tuning criteria been met?		X		
Has CCV or ICAL passed criteria?		X		CCV
Are the recoveries from the LCS acceptable?		X		
Does method blank meet method QC criteria?		X		
Are the surrogate recoveries acceptable?		X		
Are the ISTD recoveries acceptable?		X		
Are all analyses free of interference's from previous analyses? If not, does the quality of the data remain unimpaired?		X		
Have all manual integration's been flagged with an M qualifier?		X		
Are dilution factors entered correctly?		X		
Batch checked for data entry errors?		X		

Note: Any "No" answer required a comment.

Additional comments: MS/MS Failed compounds
LCS 1st & 2nd Run flagged Run 3rd LCS Passed ~~was~~ .. Approved by BBD - trying to determine cause -
spot or mix issue. 5/27/08

Completed By: Carl C
Date: 5-27-08

Reviewed By:
Date: B KR
5/27/08

Reviewed By:
Date:

Reviewed By:
Date:

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052308.B

	CLIENT SAMPLE NO.	SMC1 (DCE) #	SMC2 (TOL) #	SMC3 (BFB) #	OTHER	TOT OUT
01	MB-VOA86-1	104	101	98		0
02	LCS-VOA86-1	106	106	108		0
03	LCS-VOA86-2	104	102	104		0
04	LCS-VOA86-3	94	94	95		0
05	08052668-4	104	96	103		0
06	08052668-5	106	90	108		0
07	08052671-1	106	94	108		0
08	08052671-2	110	101	110		0
09	08052674-1	102	98	99		0
10	08052676-2	106	99	106		0
11	08052676-4	105	88	102		0
12	08052676-5	105	83	103		0
13	08052676-9	108	88	111		0
14	08052676-10	105	91	102		0
15	08052679-1	104	99	99		0
16	08052679-2	103	99	107		0
17	08052698-1	108	98	102		0
18	052882-3	110	86	101		0
19	052882-3MS	109	79	96		0
20	052882-3MSD	105	91	97		0
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

QC LIMITS

SMC1 (DCE) = 1,2-Dichloroethane-d4 (67-140)
 SMC2 (TOL) = Toluene-d8 (78-115)
 SMC3 (BFB) = Bromofluorobenzene (64-134)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052308.B

Matrix Spike - Sample No.: CCV3-VOA86-1

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Chloromethane	20		24	120	5-205
Vinyl Chloride	20		22	110	5-195
Bromomethane	20		19	95	15-185
Chloroethane	20		22	110	40-160
Trichlorofluoromethane	20		22	110	50-150
1,1-Dichloroethene	20		20	100	50-150
Methylene Chloride	20		20	100	60-140
trans-1,2-Dichloroethene	20		20	100	70-130
1,1-Dichloroethane	20		22	110	75-130
Chloroform	20		20	100	70-135
1,1,1-Trichloroethane	20		21	105	75-125
Carbon Tetrachloride	20		22	110	75-125
Benzene	20		21	105	65-135
1,2-Dichloroethane	20		20	100	70-130
Trichloroethene	20		21	105	65-135
1,2-Dichloropropane	20		23	115	35-165
Bromodichloromethane	20		22	110	65-135
2-Chloroethyl Vinyl Eth	20		21	105	5-225
cis-1,3-Dichloropropene	20		21	105	25-175
Toluene	20		21	105	75-125
trans-1,3-Dichloropropene	20		20	100	50-150
1,1,2-Trichloroethane	20		22	110	70-130
Tetrachloroethene	20		22	110	75-125
Dibromochloromethane	20		22	110	70-135
Chlorobenzene	20		20	100	65-135
Ethylbenzene	20		20	100	60-140
Bromoform	20		20	100	70-130
1,1,2,2-Tetrachloroethane	20		20	100	60-140

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052308.B

Matrix Spike - Sample No.: CCV3-VOA86-1

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
1,3-Dichlorobenzene	20		21	105	75-125
1,4-Dichlorobenzene	20		21	105	65-135
1,2-Dichlorobenzene	20		21	105	65-135

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 0 out of 31 outside limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052308.B

Matrix Spike - Sample No.: LCS-VOA86-3

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Chloromethane	20		30	150	20-176
Vinyl Chloride	20		26	130	33-169
Bromomethane	20		20	100	35-139
Chloroethane	20		24	120	63-152
Trichlorofluoromethane	20		22	110	74-131
1,1-Dichloroethene	20		21	105	77-135
Methylene Chloride	20		22	110	85-123
trans-1,2-Dichloroethene	20		21	105	81-131
1,1-Dichloroethane	20		24	120	85-125
2-Butanone	20		8	40	10-115
Chloroform	20		21	105	85-125
1,1,1-Trichloroethane	20		23	115	85-135
Carbon Tetrachloride	20		22	110	81-141
Benzene	20		22	110	85-121
1,2-Dichloroethane	20		22	110	77-143
Trichloroethene	20		22	110	83-127
1,2-Dichloropropane	20		23	115	85-117
Bromodichloromethane	20		22	110	85-120
2-Chloroethyl Vinyl Eth	20		17	85	65-134
cis-1,3-Dichloropropene	20		21	105	85-120
4-Methyl-2-Pentanone	20		21	105	73-147
Toluene	20		22	110	85-122
trans-1,3-Dichloropropene	20		19	95	80-117
1,1,2-Trichloroethane	20		23	115	82-123
Tetrachloroethene	20		21	105	82-123
Dibromochloromethane	20		22	110	77-123
Chlorobenzene	20		21	105	83-125
Ethylbenzene	20		21	105	81-126

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052308.B

Matrix Spike - Sample No.: LCS-VOA86-3

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Bromoform	20		20	100	56-140
1,1,2,2-Tetrachloroethane	20		22	110	58-142
1,3-Dichlorobenzene	20		22	110	70-123
1,4-Dichlorobenzene	20		22	110	70-127
1,2-Dichlorobenzene	20		21	105	67-124

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 0 out of 33 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

Lab Name: PDC LABORATORIES, INC. Contract:

MB-VOA86-1

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052308.B

Lab File ID: MB052304 Lab Sample ID: MB-VOA86-1

Date Analyzed: 05/23/08 Time Analyzed: 1036

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: MB

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01 LCS-VOA86-1	LCS-VOA86-1	MB052305	1106
02 LCS-VOA86-2	LCS-VOA86-2	MB052306	1149
03 LCS-VOA86-3	LCS-VOA86-3	MB052307	1240
04 08052668-4	08052668-4	MB052308	1344
05 08052668-5	08052668-5	MB052309	1414
06 08052671-1	08052671-1D200	MB052310	1444
07 08052671-2	08052671-2D200	MB052311	1515
08 08052674-1	08052674-1D5	MB052312	1545
09 08052676-2	08052676-2	MB052313	1616
10 08052676-4	08052676-4	MB052314	1646
11 08052676-5	08052676-5	MB052315	1716
12 08052676-9	08052676-9	MB052316	1746
13 08052676-10	08052676-10	MB052317	1816
14 08052679-1	08052679-1D200	MB052318	1847
15 08052679-2	08052679-2D200	MB052319	1917
16 08052698-1	08052698-1	MB052320	1947
17 052882-3	08052882-3	MB052321	2018
18 052882-3MS	08052882-3MS	MB052322	2048
19 052882-3MSD	08052882-3MSD	MB052323	2118
20			
21			
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COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052308.B

Lab File ID: MB052301 BFB Injection Date: 05/23/08

Instrument ID: MB BFB Injection Time: 0847

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	32.3
75	30.0 - 60.0% of mass 95	58.5
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.2
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	50.2
175	5.0 - 9.0% of mass 174	3.2 (6.3)1
176	95.0 - 101.0% of mass 174	49.9 (99.3)1
177	5.0 - 9.0% of mass 176	2.8 (5.7)2

1-Value is % mass 174

2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01 CCV3-VOA86-1	CCV3-VOA86-1	MB052302	05/23/08	0917
02 MB-VOA86-1	MB-VOA86-1	MB052304	05/23/08	1036
03 LCS-VOA86-1	LCS-VOA86-1	MB052305	05/23/08	1106
04 LCS-VOA86-2	LCS-VOA86-2	MB052306	05/23/08	1149
05 LCS-VOA86-3	LCS-VOA86-3	MB052307	05/23/08	1240
06 08052668-4	08052668-4	MB052308	05/23/08	1344
07 08052668-5	08052668-5	MB052309	05/23/08	1414
08 08052671-1	08052671-1D200	MB052310	05/23/08	1444
09 08052671-2	08052671-2D200	MB052311	05/23/08	1515
10 08052674-1	08052674-1D5	MB052312	05/23/08	1545
11 08052676-2	08052676-2	MB052313	05/23/08	1616
12 08052676-4	08052676-4	MB052314	05/23/08	1646
13 08052676-5	08052676-5	MB052315	05/23/08	1716
14 08052676-9	08052676-9	MB052316	05/23/08	1746
15 08052676-10	08052676-10	MB052317	05/23/08	1816
16 08052679-1	08052679-1D200	MB052318	05/23/08	1847
17 08052679-2	08052679-2D200	MB052319	05/23/08	1917
18 08052698-1	08052698-1	MB052320	05/23/08	1947
19 052882-3	08052882-3	MB052321	05/23/08	2018
20 052882-3MS	08052882-3MS	MB052322	05/23/08	2048
21 052882-3MSD	08052882-3MSD	MB052323	05/23/08	2118
22				

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052308.B

Instrument ID: MB Calibration Date: 05/23/08 Time: 0917

Lab File ID: MB052302 Init. Calib. Date(s): 05/21/08 05/21/08

Heated Purge: (Y/N) N Init. Calib. Times: 1750 2022

GC Column: RTX-624 ID: 0.18 (mm)

COMPOUND	RRF	RRF20	MIN RRF	%D	MAX %D
Dichlorodifluoromethane	0.261	0.320	0.01	22.6	35.0
Chloromethane	0.441	0.523	0.01	18.6	35.0
Vinyl Chloride	0.447	0.498	0.01	11.4	35.0
Bromomethane	0.369	0.351	0.01	4.9	35.0
Chloroethane	0.348	0.378	0.01	8.6	35.0
Trichlorofluoromethane	0.463	0.504	0.01	8.8	35.0
Dichlorofluoromethane	0.898	0.943	0.01	5.0	35.0
Ethyl Ether	0.347	0.348	0.01	0.3	35.0
Acrolein	0.082	0.074	0.01	9.8	35.0
Freon	0.305	0.327	0.01	7.2	35.0
1,1-Dichloroethene	0.320	0.319	0.01	0.3	35.0
Acetone	0.144	0.112	0.01	22.2	35.0
Iodomethane	0.331	0.404	0.01	22.0	35.0
Carbon Disulfide	1.057	1.092	0.01	3.3	35.0
Isopropanol	0.023	0.021	0.01	8.7	35.0
3-Chloroprene	0.186	0.198	0.01	6.4	35.0
Acetonitrile	0.061	0.059	0.01	3.3	35.0
Methylene Chloride	0.413	0.421	0.01	1.9	35.0
MTBE	0.803	0.792	0.01	1.4	35.0
trans-1,2-Dichloroethene	0.362	0.360	0.01	0.6	35.0
Acrylonitrile	0.143	0.135	0.01	5.6	35.0
Hexane	0.614	0.619	0.01	0.8	35.0
1,1-Dichloroethane	0.756	0.833	0.01	10.2	35.0
Chloroprene	0.549	0.607	0.01	10.6	35.0
Vinyl Acetate	0.653	0.837	0.01	28.2	35.0
1-Propanol	0.001	0.002	0.01	100.0	35.0
2,2-Dichloropropane	0.425	0.460	0.01	8.2	35.0
cis-1,2-Dichloroethene	0.315	0.321	0.01	1.9	35.0
2-Butanone	0.420	0.402	0.01	4.3	35.0
Ethyl Acetate	0.120	0.129	0.01	7.5	35.0
Propionitrile	0.042	0.041	0.01	2.4	35.0
Bromochloromethane	0.122	0.119	0.01	2.4	35.0
Tetrahydrofuran	0.026	0.024	0.01	7.7	35.0
Methacrylonitrile	0.210	0.202	0.01	3.8	35.0
sec-Butanol	0.020	0.018	0.01	10.0	35.0
Chloroform	0.594	0.590	0.01	0.7	35.0
Cyclohexane	0.606	0.621	0.01	2.5	35.0

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FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052308.B

Instrument ID: MB Calibration Date: 05/23/08 Time: 0917

Lab File ID: MB052302 Init. Calib. Date(s): 05/21/08 05/21/08

Heated Purge: (Y/N) N Init. Calib. Times: 1750 2022

GC Column: RTX-624 ID: 0.18 (mm)

COMPOUND	RRF	RRF20	MIN RRF	%D	MAX %D
1,1,1-Trichloroethane	0.387	0.402	0.01	3.9	35.0
Carbon Tetrachloride	0.274	0.296	0.01	8.0	35.0
1,1-Dichloropropene	0.477	0.500	0.01	4.8	35.0
Benzene	1.278	1.319	0.01	3.2	35.0
1,2-Dichloroethane	0.796	0.813	0.01	2.1	35.0
Isobutanol	0.011	0.010	0.01	9.1	35.0
Propyl Ether	0.257	0.267	0.01	3.9	35.0
Trichloroethene	0.279	0.293	0.01	5.0	35.0
n-Butanol	0.005	0.004	0.01	20.0	35.0
1,2-Dichloropropane	0.358	0.405	0.01	13.1	35.0
Dibromomethane	0.101	0.109	0.01	7.9	35.0
1,4-Dioxane	0.002	0.002	0.01	0.0	35.0
Methyl Methacrylate	0.323	0.321	0.01	0.6	35.0
Bromodichloromethane	0.399	0.433	0.01	8.5	35.0
2-Nitropropane	0.066	0.070	0.01	6.1	35.0
2-Chloroethyl Vinyl Ether	0.177	0.190	0.01	7.3	35.0
cis-1,3-Dichloropropene	0.497	0.518	0.01	4.2	35.0
4-Methyl-2-Pentanone	0.280	0.293	0.01	4.6	35.0
Toluene	0.682	0.707	0.01	3.7	35.0
trans-1,3-Dichloropropene	0.410	0.419	0.01	2.2	35.0
Ethyl Methacrylate	1.494	1.498	0.01	0.3	35.0
1,1,2-Trichloroethane	0.205	0.222	0.01	8.3	35.0
Tetrachloroethene	0.232	0.252	0.01	8.6	35.0
1,3-Dichloropropane	0.785	0.803	0.01	2.3	35.0
2-Hexanone	0.768	0.670	0.01	12.8	35.0
Dibromochloromethane	0.326	0.355	0.01	8.9	35.0
1,2-Dibromoethane	0.337	0.355	0.01	5.3	35.0
Chlorobenzene	1.133	1.148	0.01	1.3	35.0
Ethylbenzene	0.602	0.603	0.01	0.2	35.0
1,1,1,2-Tetrachloroethane	0.336	0.334	0.01	0.6	35.0
Meta-Para Xylenes	0.764	0.758	0.01	0.8	35.0
0-Xylene	0.695	0.670	0.01	3.6	35.0
Styrene	1.267	1.222	0.01	3.6	35.0
Bromoform	0.140	0.139	0.01	0.7	35.0
Isopropylbenzene	3.790	3.826	0.01	0.9	35.0
Cyclohexanone	0.015	0.011	0.01	26.7	35.0
Bromobenzene	2.184	2.268	0.01	3.8	35.0

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FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052308.B

Instrument ID: MB Calibration Date: 05/23/08 Time: 0917

Lab File ID: MB052302 Init. Calib. Date(s): 05/21/08 05/21/08

Heated Purge: (Y/N) N Init. Calib. Times: 1750 2022

GC Column: RTX-624 ID: 0.18 (mm)

COMPOUND	RRF	RRF20	MIN RRF	%D	MAX %D
1,1,2,2-Tetrachloroethane	1.237	1.263	0.01	2.1	35.0
n-Propylbenzene	1.095	1.147	0.01	4.7	35.0
1,2,3-Trichloropropane	1.071	1.052	0.01	1.8	35.0
trans-1,4-Dichloro-2-Butene	0.319	0.342	0.01	7.2	35.0
2-Chlorotoluene	0.952	1.027	0.01	7.9	35.0
1,3,5-Trimethylbenzene	3.602	3.810	0.01	5.8	35.0
4-Chlorotoluene	1.016	1.038	0.01	2.2	35.0
tert-Butylbenzene	2.769	2.996	0.01	8.2	35.0
Pentachloroethane	0.110	0.117	0.01	6.4	35.0
1,2,4-Trimethylbenzene	3.600	3.728	0.01	3.6	35.0
sec-Butylbenzene	4.772	5.042	0.01	5.6	35.0
1,3-Dichlorobenzene	1.669	1.778	0.01	6.5	35.0
p-Isopropyltoluene	3.664	3.941	0.01	7.6	35.0
1,4-Dichlorobenzene	1.785	1.885	0.01	5.6	35.0
n-Butylbenzene	4.340	4.730	0.01	9.0	35.0
1,2-Dichlorobenzene	1.584	1.694	0.01	6.9	35.0
1,2,4-Trichlorobenzene	0.724	0.796	0.01	9.9	35.0
Hexachlorobutadiene	0.261	0.326	0.01	24.9	35.0
Naphthalene	2.261	2.095	0.01	7.3	35.0
1,2,3-Trichlorobenzene	0.661	0.681	0.01	3.0	35.0
1,2-Dibromo-3-chloropropane	0.170	0.171	0.01	0.6	35.0
1,2-Dichloroethane-d4	0.370	0.351	0.01	5.1	35.0
Toluene-d8	0.860	0.846	0.01	1.6	35.0
Bromofluorobenzene	1.324	1.301	0.01	1.7	35.0

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: PDC LABORATORIES, INC. Contract:

Lab Code: PDC Case No.: SAS No.: SDG No.: MB052308.B

Lab File ID (Standard): MB052302 Date Analyzed: 05/23/08

Instrument ID: MB Time Analyzed: 0917

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

	IS1 AREA #	RT #	IS2 (CBZ) AREA #	RT #	IS3 (DCB) AREA #	RT #
12 HOUR STD	101936	7.60	59677	12.61	23966	16.72
UPPER LIMIT	203872	8.10	119354	13.11	47932	17.22
LOWER LIMIT	50968	7.10	29839	12.11	11983	16.22
CLIENT SAMPLE NO.						
01 MB-VOA86-1	89425	7.60	53232	12.60	19193	16.70
02 LCS-VOA86-1	85276	7.59	51521	12.60	17809	16.71
03 LCS-VOA86-2	81322	7.59	48919	12.61	16182	16.72
04 LCS-VOA86-3	91749	7.60	54452	12.62	19491	16.72
05 08052668-4	80854	7.60	47605	12.62	16412	16.72
06 08052668-5	78953	7.59	45710	12.61	14799	16.71
07 08052671-1	79484	7.59	44629	12.60	14829	16.70
08 08052671-2	75874	7.59	45420	12.61	14724	16.71
09 08052674-1	80817	7.59	47720	12.61	17142	16.71
10 08052676-2	73898	7.59	46387	12.61	15158	16.71
11 08052676-4	75150	7.59	47198	12.61	15951	16.71
12 08052676-5	78147	7.60	47614	12.60	16134	16.72
13 08052676-9	72972	7.60	42897	12.61	13917	16.71
14 08052676-10	77940	7.60	47065	12.60	14330	16.70
15 08052679-1	75312	7.60	47816	12.60	15972	16.71
16 08052679-2	78336	7.59	47788	12.61	15621	16.71
17 08052698-1	72103	7.60	45598	12.60	14808	16.72
18 052882-3	75032	7.60	46336	12.61	15545	16.72
19 052882-3MS	74588	7.59	44721	12.60	15575	16.71
20 052882-3MSD	77214	7.59	46325	12.60	15915	16.71
21						
22						

IS1 = Fluorobenzene
 IS2 (CBZ) = Chlorobenzene-d5
 IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

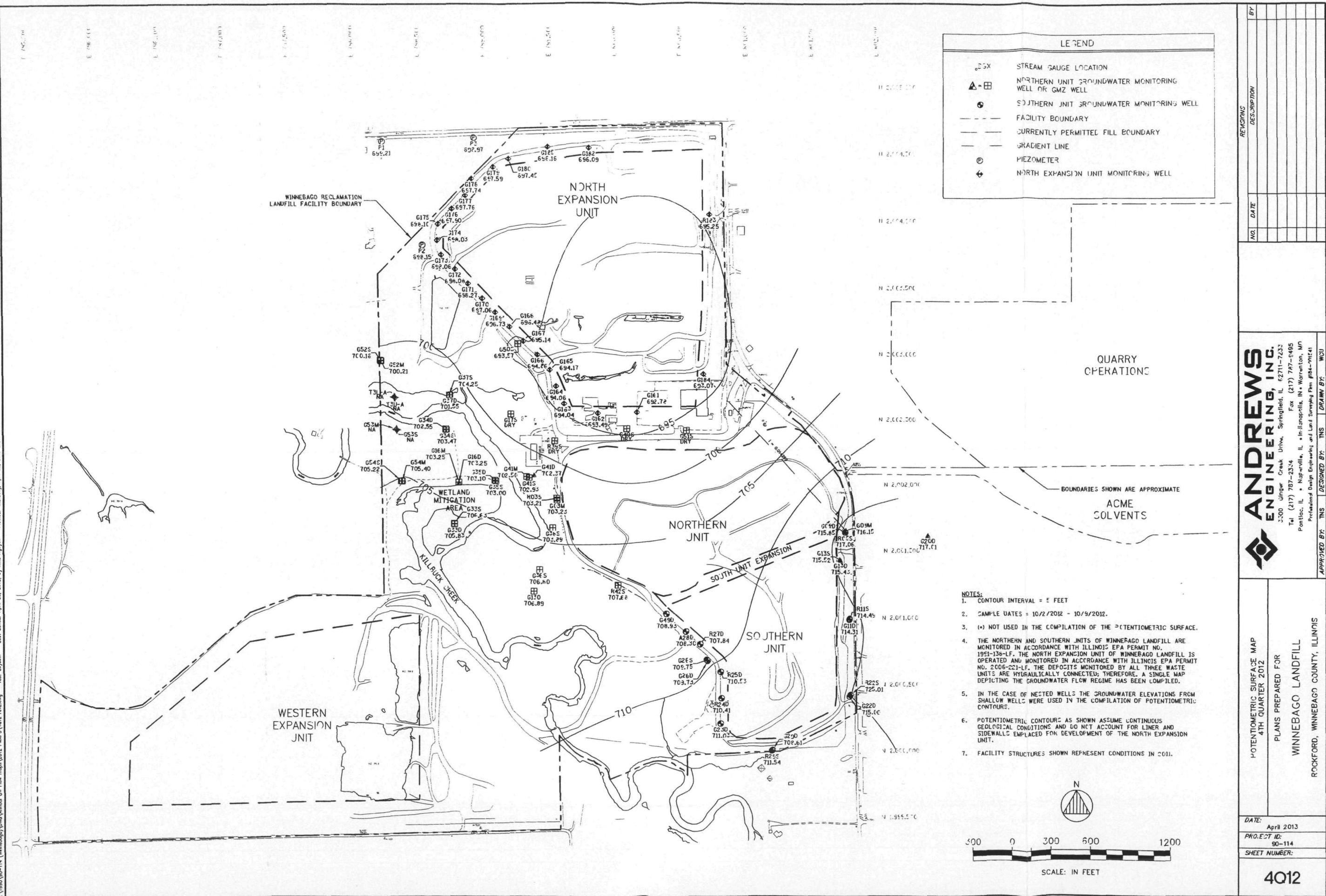
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.

* Values outside of QC limits.

ATTACHMENT 4

REVISED POTENTIOMETRIC SURFACE MAP 4Q12



Plotted: Thursday, April 25, 2013 2:26:45 PM
Last Searched: April 25, 2013, by Mike Nguyen
Tab: Layout
C:\Flow mrops\2012\PLADS\4012\ref2.dwg
C:\Flow mrops\2012\PLADS\4012\ref2.dwg
C:\Flow mrops\2012\PLADS\4012\ref2.dwg
C:\Flow mrops\2012\PLADS\4012\ref2.dwg